XIV MEDECOS
&
XIII AEET meeting

Human driven scenarios for evolutionary and ecological changes

Abstract book

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S.01-3-Oral

A spatial modeling approach to assess fire risk and exposure of biodiversity hotspots in Cephalonia island, Greece

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Recent global changes seem to have affected fire regimes by inducing more severe larger fires in the thermomediterranean vegetation zone but also more frequent incidents in territories of higher altitudes. Cephalonia island hosts Mt Ainos, one of the most important National Parks of Greece, focal geographical area of the non-fire adapted endemic fir Abies cephalonica. The island has suffered several fires in the past. The aim of this work is to introduce a framework for assessing spatial fire risk and exposure of biodiversity hot spot areas, using Cephalonia as a pilot case study. Fuel parameters in representative vegetation types were measured across the island for models development as well as for collecting training and validation points for satellite data classification. The Minimum Travel Time algorithm, as it is embedded in FlamMap spatial fire simulation software, was applied in order to assess critical fire behavior parameters and exposure of the island's biodiversity hotspots under three different meteorological and fuel moisture scenarios simulating predicted climate changes. In addition, the risk of change in the island's ecological value due to biodiversity loss was studied under the same scenarios. According to the analysis, loss of all biodiversity values was found under the severe meteorological and fuel moisture scenario and was estimated to be higher in the endemic fir forests. The outputs of this study may be used as an application of quantitative and probabilistic risk assessment for biodiversity conservation planning, prioritization and management of high value natural and cultural resources.

S.01-4-Oral

Temporal patters of acetate and ammonium uptake during leaf litter decomposition of 5 Mediterranean riparian tree species: a stable isotope tracer study

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Riparian leaf litter is a fundamental source of carbon and nutrients to stream ecosystems. Moreover, microbial assemblages colonizing leaf litter can use carbon and nutrients from the water column, though the influence of this uptake on stream metabolism and in-stream nutrient retention capacity is largely unknown. We quantified leaf litter decomposition (k) together with acetate and ammonium (NH4) assimilation rates (acetate-U and NH4-U, respectively) for 5 Mediterranean riparian tree species (common ash, alder, black poplar, black locust and sycamore). To do so, we added 15N-NH4 and 13C-acetate into a stream containing leaf litter mesh bags at 5 different decomposition stages (i.e., previously immersed during 2, 10, 30, 45 and 75 days). Moreover, we quantified cellobiohydrolase (cbh) enzymatic activity as a proxy of microbial activity during decomposition. NH4-U remained quite constant during decay (0.97±0.18 µg NH4 d-1 mgN-1). Acetate-U increased from 0.8 (day 2) to 11 (day 75) mg C-acetate d-1 g C-1. Fast decomposing species (high k) used more acetate throughout the experiment than slow decomposing species (low k), which showed higher accumulated NH4-U. Our results suggest strong links between riparian leaf litter decomposition, and in-stream nutrient cycling, and further that different leaf litter species could influence C and N cycling to a different extend depending on their degree of degradability.